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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,847	08/25/2003	Kazunori Masuda	00862.022501.1	1797
5514	7590	08/19/2004	EXAMINER	
FITZPATRICK CELLA HARPER & SCINTO			NGUYEN, LAM S	
30 ROCKEFELLER PLAZA			ART UNIT	
NEW YORK, NY 10112			PAPER NUMBER	

2853

DATE MAILED: 08/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/646,847	Applicant(s) MASUDA ET AL.	
	Examiner LAM S NGUYEN	Art Unit 2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 15-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8, 9 and 15-20 is/are rejected.
- 7) ☒ Claim(s) 6, 7 and 21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 August 2003 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 10/059,440.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 9 recites the limitation "said heat source number diction means". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 3-5, 18, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imanaka et al. (US 6116714) in view of Schantz (EP 0642925 A2).

Imanaka et al. disclose a printing apparatus (a thermal ink jet printer) which performs printing by moving a carriage unit (*FIG. 15*), capable of holding a printhead having a plurality of heater resistances (*FIG. 8, element 901*), over a print medium based on information transmitted by an external apparatus (*FIG. 16: The information is transmitted to the printing apparatus from an external device through the interface 1700*), comprising:

reception means (*FIG. 1, element 10*) for receiving an information signal, related to a property of the heater resistances, transmitted from the printhead (*FIG. 1, element 12, column 2, lines 38-41: The heater resistances in a heater board 1000 (FIG. 4) are identical but different in value to the heater resistances in other heater boards. The rank detecting resistor RH*

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or the resistor monitor 914 (FIG. 12) is provided on each heater board 1000 having the resistance value identical to the one of the heater resistances in the same heater board.

Therefore, by sensing the resistance value of the RH or the resistor monitor, the reception means 10 knows the information relating to the property of the heater resistances); and

a voltage control unit (FIG. 1, elements 7, 9) for generating a driving voltage generated in the printing apparatus to drive the printhead based on the information signal received by said reception means (column 3, lines 45-50).

Imanaka et al. do not disclose wherein said voltage control unit is provided on the carriage unit.

Schantz discloses a printer that performs printing by scanning a carriage unit (FIG. 3, element 48), capable of holding an ink jet printhead (FIG. 3, element 50 and FIG. 1a-b) over a print medium, wherein the carriage unit comprises a voltage control unit for controlling the printhead (*in term of "power-conditioning circuitry" (Abstract)*) for regulating the power provided to nozzle resistors (column 3, line 39-47).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the carriage unit in the printing apparatus disclosed by Stephenson et al. such that providing the voltage control unit for controlling the printhead on the carriage unit as disclosed by Schantz. The motivation of doing so is to avoid a high peak current transmission between a stationary device and a scanning print device in order to avoid the electrical fault caused by the flow of the high current in the connection as taught by Schantz (column 3, line 57 to column 4, line 2).

Imanaka et al. also disclose the following claimed invention:

Referring to claim 3: wherein the information signal includes an identification signal for identifying a type of the printhead, and said voltage generation means controls the driving voltage in accordance with the identification signal (*FIG. 1, element 12, column 2, lines 38-41: Since the rank detecting resistor RH or the resistor monitor 914 (FIG. 12) has the resistance value identical to the one of the heater resistances, by sensing the resistance value of the RH or the resistor monitor, the reception means 10 knows if the printhead is in a thermal type*).

Referring to claims 4-5: wherein the information signal includes a signal indicative of a variation of a plurality of heater resistances provided in the printhead or temperature data of the printhead, and said voltage control unit controls the voltage in accordance with the signal (*column 3, lines 45-50*).

Referring to claim 19: further comprising a main board for controlling the printing apparatus, wherein said voltage control unit adjusts the voltage outputted from said main board (*FIG. 1, 16*).

Referring to claim 20: said printhead comprising a switching device for controlling each of the plurality of heater resistances (*FIG. 8, element 902*), wherein said detection resistance is manufactured by the same semiconductor deposition process as the heater resistances (*column 6, line 66 to column 7, line 3*). (*In addition, because claim 20 is an apparatus claim, the above limitation that claims a method of manufacturing the detection resistance is considered but not given patentability weight*).

2. Claims 2, 9, 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imanaka et al. (US 6116714) in view of Schantz (EP 0642925 A2), as applied to claim 1, and

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further in view of Stephenson et al. (US 5053790) (*The rejection of claim 9 is made with an assumption that the limitation "said heat source number detection means" has already been cited*).

Imanaka et al., as modified, disclose the claimed invention as discussed above except wherein said voltage control unit is a DC/DC converter which transforms a DC voltage to be applied to the printhead into a value appropriate for driving a mounted head (**Referring to claim 2**) and the printing apparatus comprises a heat source number detection means detects the number of plurality of heat sources driven simultaneously based on an image data signal (**Referring to claims 9, 15-17**).

Stephenson et al. disclose a printing apparatus having a printhead (*FIG. 5, element 26*) comprising a plurality of heater resistances (*FIG. 5, element 534*) and a control unit for controlling a power voltage supplying to the printhead based on an information received from a detection element 506 of the printhead (*FIG. 5, element 310*), wherein the control unit is a DC/DC converter (*FIG. 5, element 513*) which transforms a DC voltage to be applied to the printhead into an appropriate value. The printing apparatus also comprises a heat source number detection means (*FIG. 7, element 310*) detects the number of plurality of heat sources driven simultaneously based on an image data signal (*FIG. 7, element 730 and Abstract*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the head voltage controller or the driving signal controller in the printing apparatus disclosed by Imanaka et al., as modified, such that the controller is a DC/DC converter which transforms a DC voltage to be applied to the printhead into an appropriate value for driving the head and comprising comprises a heat source number detection means detects the number of plurality of heat sources driven simultaneously based on an image

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data signal as disclosed by Stephenson et al. The motivation of doing so is to maintain a prescribed voltage across the selected heat elements that is substantially constant independent of the number of selected heat elements as taught by Stephenson et al. (*Abstract*).

3. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Imanaka et al. (US 6116714) in view of Schantz (EP 0642925 A2), as applied to claim 1, and further in view of Stephenson et al. (US 5053790) and Dunn (US 4982199).

Imanaka et al., as modified, disclose the claimed invention as discussed above except a heat source number detection means for detecting a number of plurality of heat sources driven simultaneously, wherein said voltage control unit adjusts a voltage outputted to the heat sources based on a signal outputted from said heat source number detection means.

Stephenson et al. disclose a printing apparatus having a heat source number detection means (*FIG. 7, element 310*) that detects the number of plurality of heat sources driven simultaneously based on an image data signal and a drive voltage is controlled based on the signal outputted from the heat source number detection means (*FIG. 7, element 730 and Abstract*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the printing apparatus disclosed by Imanaka et al., as modified, such that comprising the heat source number detection means detects the number of plurality of heat sources driven simultaneously based on an image data signal as disclosed by Stephenson et al. The motivation of doing so is to maintain a prescribed voltage across the selected heat elements that is substantially constant independent of the number of selected heat elements as taught by Stephenson et al. (*Abstract*).

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In addition, Imanaka et al., as modified, do not disclose driving pulse generation means for generating a pulse train which drives the plurality of heat sources.

Dunn discloses a thermal ink jet printer having driving pulse generation means for generating a pulse train which drives the plurality of heat sources (*FIG. 2 and FIG. 3A-G*) to control the volume of droplets by varying the pulse train thereby effecting gray scale printing (*column 2, line 10-14*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the printing apparatus disclosed by Imanaka et al., as modified, such that including driving pulse generation means for generating a pulse train which drives the plurality of heat sources as disclosed by Dunn. The motivation of doing so is to control the volume of droplets by varying the pulse train thereby effecting gray scale printing as taught by Dunn (*column 2, line 10-14*).

Allowable Subject Matter

4. Claims 6-7, 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Referring to claims 6, 21: The most pertinent art fails to disclose an internal resistance connected in series with the detection resistance, wherein said voltage generation means compares a reference voltage, divided by the internal resistance, detection resistance provided inside the printhead, with a driving voltage which drives the printhead, then controls the driving voltage so as to cancel an error in these voltages. Therefore, the claimed invention is not disclosed by the cited prior arts.

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Referring to claim 7: The most pertinent art fails to disclose wherein said voltage generation means compares a reference voltage, divided by the internal resistance, detection resistance provided inside the printhead, and the diode, with a driving voltage which drives the printhead, then corrects an error in these voltages. Therefore, the claimed invention is not disclosed by the cited prior arts.

Response to Arguments

Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S NGUYEN whose telephone number is (571)272-2151.


The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D MEIER can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LN

August 13, 2004


HAI PHAM
PRIMARY EXAMINER